Listing of the Claims:

This listing of claims will replace all previous versions of the claims:

1-28. (Cancelled)

29. (Previously Presented) A method of manufacturing a tunneling magnetoresistive element comprising:

(a) the step of forming an electrode layer on a substrate, and then laminating an antiferromagnetic layer, a pinned magnetic layer in which magnetization is pinned in a predetermined direction by an exchange coupling magnetic field with the antiferromagnetic layer, an insulating barrier layer, and a free magnetic layer in turn from the bottom to form a multilayer film;

(b) the step of forming, on the multilayer film, a lift-off resist layer having a notched portion formed on the lower side thereof;

(c) the step of removing both sides of the multilayer film leaving at least a portion of the multilayer film below the resist layer;

(d) the step of forming insulating layers, which cover side faces of the insulating barrier layer, on both sides of the multilayer film so that the multilayer film-side ends of the upper surfaces of the insulating layers are lower than both ends of the upper surface of the free magnetic layer;

(e) the step of forming domain control layers on the insulating layers by sputtering obliquely to the substrate so that the domain control layers contact both ends of the free magnetic layer, and the multilayer film-side ends of the domain control layers coincide with the both ends of the top of the multilayer film,

wherein each of the domain control layers comprises a Co-Pt alloy film or a Co-Cr-Pt alloy film,

wherein an underlying layer is formed below each of the domain control layers, that controls crystal orientation of the domain control layers, and

wherein each of the underlying layers comprises a bcc-Fe film or a Fe-Co alloy film, each of the underlying layers is disposed between each side face of the free magnetic layer and each of the domain control layers, and each of the underlying layers is in direct contact with the free magnetic layer and each of the domain control layers; and

(f) the step of removing the resist layer, and forming an electrode layer on the multilayer film and the domain control layers.

30. (Cancelled)

31. (Currently Amended) A method of manufacturing a tunneling magnetoresistive element according to Claim 29, wherein in the step (d), the insulating layers ~~or the domain control layers~~ are formed by sputtering vertically to the substrate.

32. (Original) A method of manufacturing a tunneling magnetoresistive element according to Claim 29, wherein each of the domain control layers comprises a hard magnetic material.

33. (Original) A method of manufacturing a tunneling magnetoresistive element according to Claim 29, wherein each of the domain control layers comprises a laminated film of a ferromagnetic layer and a second antiferromagnetic layer, the ferromagnetic layers being in contact with at least portions of both side surfaces of the free magnetic layer.

34. (Original) A method of manufacturing a tunneling magnetoresistive element according to Claim 29, wherein each of the insulating layers comprises an antiferromagnetic insulating layer exhibiting an antiferromagnetic property, and each of the domain control layers comprises a ferromagnetic layer.

35. (Currently Amended) A method of manufacturing a tunneling magnetoresistive element according to Claim ~~29~~33, wherein the second antiferromagnetic layer is made of α-Fe2O3.

36. (Original) A method of manufacturing a tunneling magnetoresistive element according to Claim 33, wherein the antiferromagnetic insulating layer exhibiting antiferromagnetism is made of α-Fe2O3.

37. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element comprising:

(a) the step of forming an electrode layer on a substrate, and then laminating an antiferromagnetic layer, a pinned magnetic layer in which

magnetization is pinned in a predetermined direction by an exchange coupling magnetic field with the antiferromagnetic layer, an insulating barrier layer and a free magnetic layer in turn from the bottom to form a multilayer film;

(b) the step of forming, on a sensitive zone of the multilayer film, a lift-off resist layer having a notched portion formed on the lower side thereof;

(c) the step of removing both sides of the multilayer film leaving at least a portion of the multilayer film below the resist layer;

(d) the step of forming insulating layers on both sides of the multilayer film so that the multilayer film-side ends of the upper surfaces of the insulating layers are lower than both ends of the upper surface of the free magnetic layer;

(e) the step of forming domain control layers on the insulating layers by sputtering obliquely to the substrate so that the domain control layers contact both ends of the free magnetic layer, and extend on dead zones of the multilayer film; and

(f) the step of removing the resist layer, and forming an electrode layer on the multilayer film and the domain control layers.

38. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 37, wherein an underlying layer is formed below each of the domain control layers, for controlling crystal orientation of the domain control layers.

39. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 37, wherein in the step (d), the insulating layers or the domain control layers are formed by sputtering vertically to the substrate.

40. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 37, wherein each of the domain control layers comprises a hard magnetic material.

41. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 37, wherein each of the domain control layers comprises a laminated film of a ferromagnetic layer and a second antiferromagnetic layer, the ferromagnetic layers being in contact with at least portions of both side surfaces of the free magnetic layer.

42. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 37, wherein each of the insulating layers comprises an antiferromagnetic insulating layer exhibiting an antiferromagnetic property, and each of the domain control layers comprises a ferromagnetic layer.

43. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 41, wherein the second antiferromagnetic layer is made of α-Fe_2O_3.

44. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 42, wherein the antiferromagnetic insulating layer exhibiting antiferromagnetism is made of α-Fe_2O_3.

45. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element comprising:

(a) the step of forming an electrode layer on a substrate, and then laminating a free magnetic layer, an insulating barrier layer, a pinned magnetic layer, and an antiferromagnetic layer for pinning magnetization of the pinned magnetic layer in a predetermined direction by an exchange coupling magnetic field in turn from the bottom to form a multilayer film;

(b) the step of forming, on the multilayer film, a lift-off resist layer having a notched portion formed on the lower side thereof;

(c) the step of removing both sides of the multilayer film leaving a portion of the multilayer film below the resist layer;

(d) the step of forming domain control layers on both sides of the multilayer film so that the multilayer film- side ends contact at least portions of both ends of the free magnetic layer;

(e) the step of forming insulating layers on the domain control layers by sputtering obliquely to the multilayer film so that the multilayer film-side ends of the upper surfaces of the insulating layers coincide with both ends of the upper surface of the multilayer film; and

(f) the step of removing the resist layer, and forming an electrode layer on the multilayer film and the insulating layers.

46. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 45, wherein an under laying layer is formed below each of the domain control layers, for controlling crystal orientation of the domain control layers.

47. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 45, wherein in the step (d), the insulating layers or the domain control layers are formed by sputtering vertically to the substrate.

48. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 45, wherein each of the domain control layers comprises a hard magnetic material.

49. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 45, wherein each of the domain control layers comprises a laminated film of a ferromagnetic layer and a second antiferromagnetic layer, the ferromagnetic layers being in contact with at least portions of both side surfaces of the free magnetic layer.

50. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 45, wherein each of the insulating layers comprises an antiferromagnetic insulating layer exhibiting an antiferromagnetic property, and each of the domain control layers comprises a ferromagnetic layer.

51. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 49, wherein the second antiferromagnetic layer is made of α-Fe2O3.

52. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 50, wherein the antiferromagnetic insulating layer exhibiting antiferromagnetism is made of α-Fe_2O_3.

53. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element comprising:

(a) the step of forming an electrode layer on a substrate, and then laminating a free magnetic layer, an insulating barrier layer, a pinned magnetic layer,

and an antiferromagnetic layer for pinning magnetization of the pinned magnetic layer in a predetermined direction by an exchange coupling magnetic field in turn from the bottom to form a multilayer film;

(b) the step of forming, on a sensitive zone of the multilayer film, a lift-off resist layer having a notched portion formed on the lower side thereof;

(c) the step of removing both sides of the multilayer film leaving at least a portion of the multilayer film below the resist layer;

(d) the step of forming domain control layers on both sides of the multilayer film so that the multilayer film- side ends contact at least portions of both ends of the free magnetic layer;

(e) the step of forming insulating layers on the domain control layers by sputtering obliquely to the multilayer film so that the insulating layers extend on dead zones of the multilayer film; and

(f) the step of removing the resist layer, and forming an electrode layer on the multilayer film and the insulating layers.

54. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 53, wherein an under laying layer is formed below each of the domain control layers, for controlling crystal orientation of the domain control layers. 54. A method of manufacturing a tunneling magnetoresistive element according to Claim 53, wherein an under laying layer is formed below each of the domain control layers, for controlling crystal orientation of the domain control layers. 54. A method of manufacturing a tunneling magnetoresistive element according to Claim 53, wherein an under laying layer is formed below each of the domain control layers, for controlling crystal orientation of the domain control layers.

55. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 53, wherein in the step (d), the insulating layers or the domain control layers are formed by sputtering vertically to the substrate.

56. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 53, wherein each of the domain control layers comprises a hard magnetic material.

57. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 53, wherein each of the domain control layers comprises a laminated film of a ferromagnetic layer and a second antiferromagnetic layer, the ferromagnetic layers being in contact with at least portions of both side surfaces of the free magnetic layer.

58. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 53, wherein each of the insulating layers comprises an antiferromagnetic insulating layer exhibiting an antiferromagnetic property, and each of the domain control layers comprises a ferromagnetic layer.

59. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 57, wherein the second antiferromagnetic layer is made of α-Fe2O3.

60. (Withdrawn) A method of manufacturing a tunneling magnetoresistive element according to Claim 58, wherein the antiferromagnetic insulating layer exhibiting antiferromagnetism is made of α-Fe2O3.

61. (New) A method of manufacturing a tunneling magnetoresistive element according to Claim 31, wherein in the step (d), the insulating layers are formed by ion beam sputtering, long throw sputtering, or collimation sputtering.

62. (New) A method of manufacturing a tunneling magnetoresistive element according to Claim 29, wherein in the step (c), during the removal of both sides of the multilayer film, the antiferromagnetic layer is etched out to an intermediate position to form a protrusion that protrudes near the center thereof and base protions that extend from bottom sides of the protrusion toward both sides.